

Improving the Bottom Line ...through Energy Efficiency

*Governor's Office of Energy
Management and Conservation*

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Anaerobic Digesters and Methane Recovery Workshop

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Morgan County Rural Electric Association



Working with the Agricultural Industry

Improving the Bottom Line...

Through Waste and Energy Efficiency

Smell the Money....Smell the Power



Improving the Bottom Line in Animal Farms

- Demonstrate cost-effectiveness of energy-saving opportunities in animal farms
- Share the strategy of performance contracting to pay for facility improvements
- Offer technical assistance



Energy Audits of Two Colorado Animal Farms

Energy Audits at two similar farrow-to-wean facilities to compare energy use

- **Colorado Pork (5,400 sows)** is a relatively new facility built in 1999 and designed with energy efficiency in mind
- **Similar Farm (5,600 sows)** is a typical facility with opportunities for energy efficiency



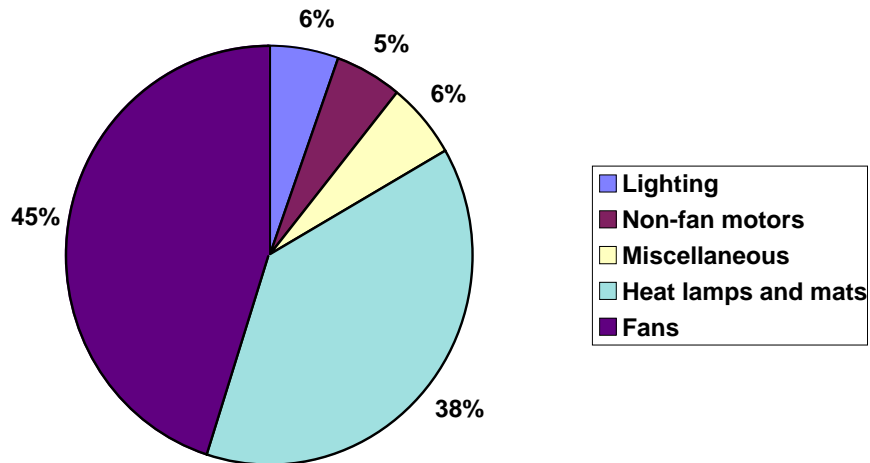
Colorado Pork Energy Saving Features

- **On-site generation**
- **Compact fluorescent lighting**
- **High-efficiency motors**
- **Computer controlled natural ventilation**
- **High-efficiency heating furnaces and water heaters**

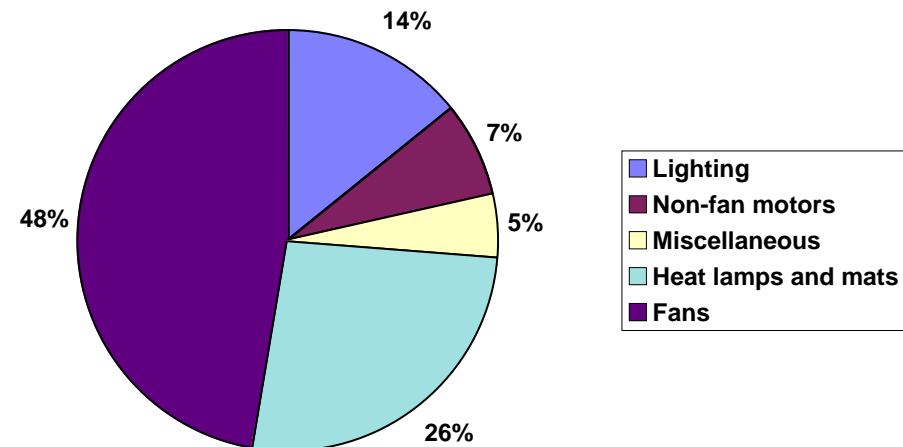


Annual Electrical Consumption

Colorado Pork

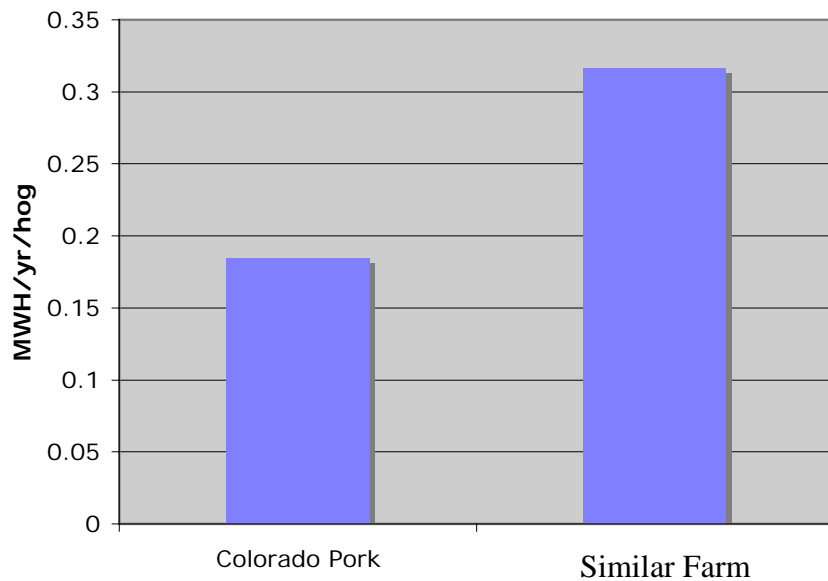


Similar Farm

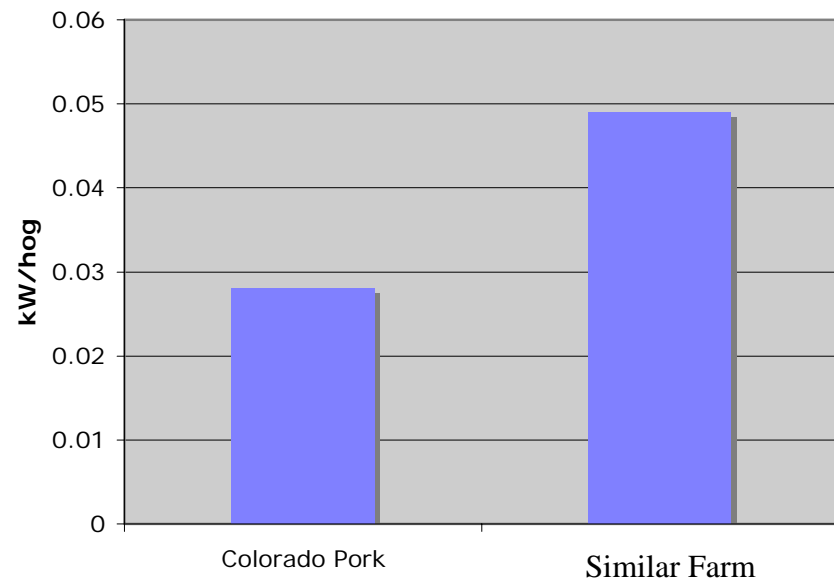


Electric Use per Hog

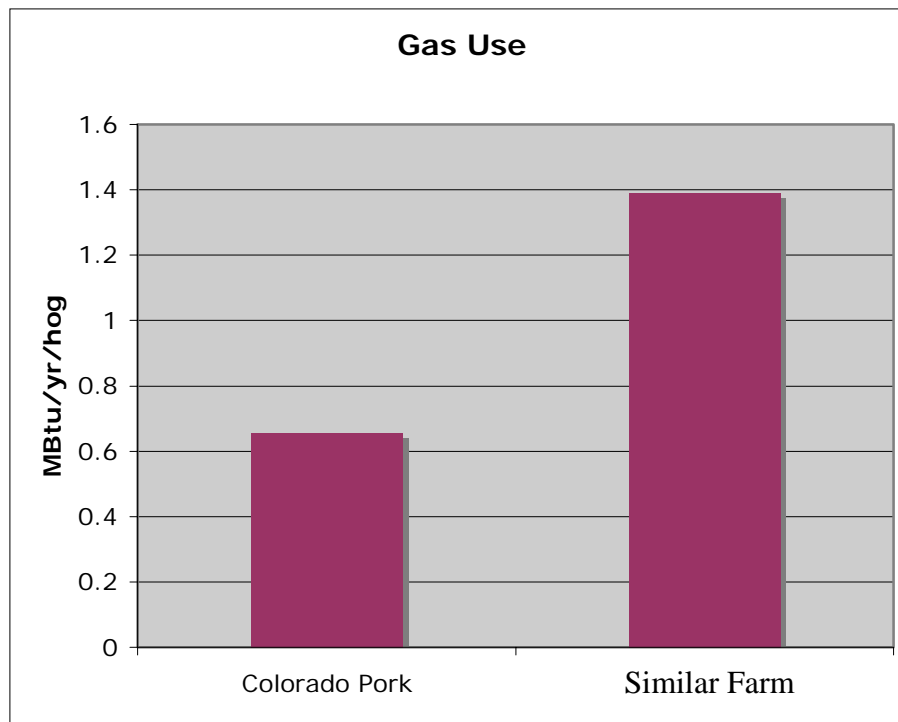
Electricity Use



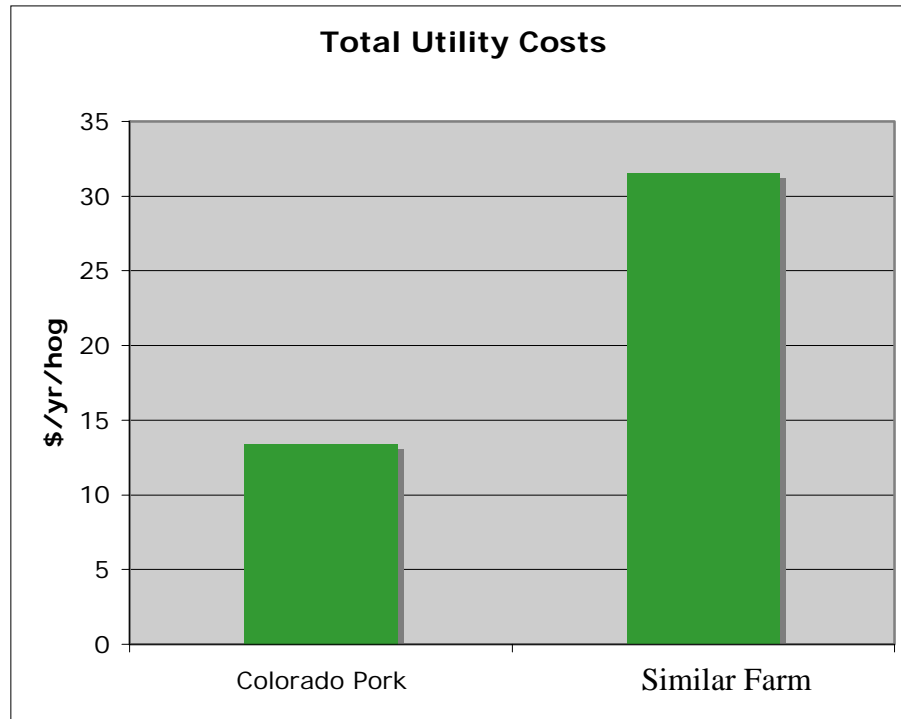
Peak Demand



Gas Use per Hog



Costs per Hog



\$19 per hog per year
lower costs

\$90,000 per year
to bottom line



Energy Audit of Similar Farm Savings Opportunities

- **Lighting Upgrade - use T8 lamps and electronic ballasts - reduce lighting levels**
- **Lighting Controls - turn off lights when daylight available**
- **Heat Lamp replacement - replace two 125 watt lamps with one 250 watt lamp with high and low setting - use low setting after 5 days**
- **Recommissioning of control systems**



Energy Audit of Similar Farm Savings Opportunities

- **Increase use of free cooling in gestation building - automate curtains or operate manually**
- **Electricity billing errors**
- **Downsize electric service - reduce access charge**
- **Change electric rates**
- **High efficiency motors**
- **On-site generation with anaerobic digester**



Savings projections

Energy Efficiency Measure	Estimated Cost	Estimated Annual Savings	Estimated Simple Payback (Yrs)
Lighting Upgrade	\$26,000	\$4,100	6
Lights Off when Daylight Available	\$0	\$1,900	0
Heat Lamp Replacement	\$22,000	\$5,400	4
Recommissioning of Controls	\$5,000	\$3,000	2
Increased Use of Gestation Curtains	\$14,000	\$1,500	9
Electric Billing Errors	\$0	\$2,900	0
Downsized Electric Service	\$0	\$1,300	0
Switching Electric Rates	\$0	\$800	0
Anarobic Digester/Generator	\$430,000	\$38,865	11
Total	\$497,000	\$59,765	8



Paying for Energy Efficiency through performance contracting

PERFORMANCE CONTRACTING

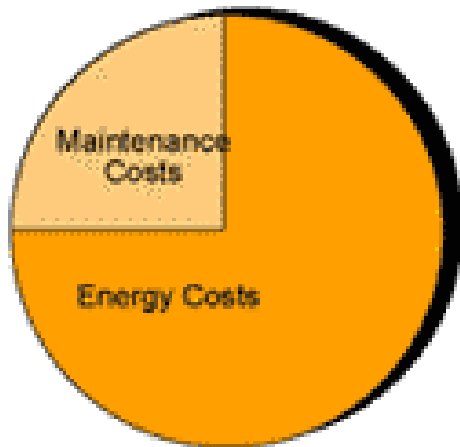
- A way to upgrade your facilities without dipping into your capital budget
- Use future energy savings to pay for projects



Here's How It Works.....

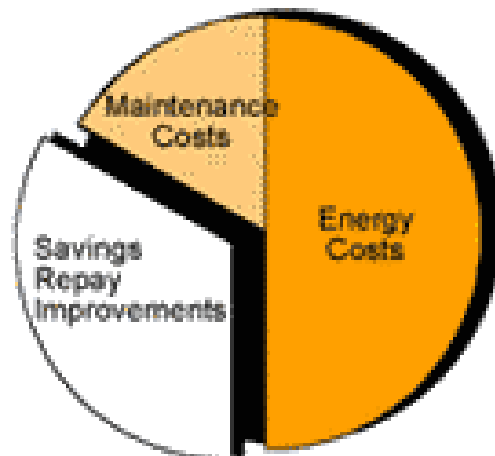
Annual Budget

Before Improvements



Annual Budget

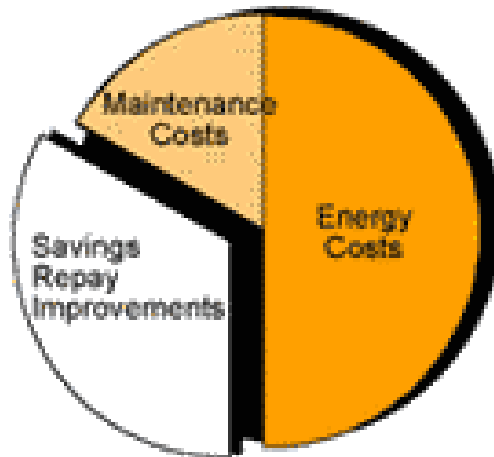
After Improvements



*Money otherwise owed to
the gas or electric utility
pays for equipment!*

Paying through Savings

Annual Budget
AFTER Improvements



- Financed through lease-purchase agreement
- Annual cost savings exceed annual payments









Contract with an ESCO

**Energy Service Company
(ESCO)**



Your ESCO will put the pieces together

-  **Identify and evaluate opportunities (energy audit)**
-  **Design systems, specify & purchase equipment**
-  **Manage construction**
-  **Arrange for financing**
-  **Provide long-term energy management services**
-  **Guarantee performance!**



5 Steps to Success

1

Decide if performance contracting is right for you
(Assess your needs & potential benefits)

2

Select an Energy Service Company, ESCO
(Consider different firms to select one that meets your needs)

3

ESCO identifies energy-saving opportunities
(Develop an audit contract)

4

ESCO implements projects
(Negotiate an Energy Performance Contract)

5

Verify savings and enjoy the benefits
(Monitor long-term performance)



How We Can Help You

- **Engineering study to identify opportunities**
- **On-site assistance & trouble-shooting**
- **Help negotiate contracts**
- **Ongoing engineering assistance**
- **Presentations to management**



Rebuild Colorado Services

**Rebuild Colorado is here
to get you started
and see you through!**

